

NON-PUBLIC?: N
ACCESSION #: 9005230116
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas, Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000499

TITLE: Reactor Trip Due to Failure of a Main Turbin Electrohydraulic
Control Line
EVENT DATE: 04/14/90 LER #: 90-005-00 REPORT DATE: 05/15/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Charles Ayala - Supervising Licensing Engineer

TELEPHONE: (512) 972-8628

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On April 14, 1990, Unit 2 was in Mode 1 at 100 percent power. At 1704 hours, a simultaneous reactor and turbine trip occurred on low turbine electrohydraulic control (EHC) fluid pressure. The plant was brought to a stable shutdown in Mode 3 with no unexpected post-trip transients. The cause of this event was failure of the EHC supply line to a main turbine governor valve. The line failed due to fatigue stress of a weld caused by governor valve-induced vibration. The valve vibration was caused by valve plug rotation. Interim corrective action has been taken to repair the EHC supply piping and add additional supports. The valve used to throttle flow during full power operation will be modified to add anti swirl baffles and anti rotation pins on the plug to stem connection during the first refueling outage.

A1/LER005U2.L01

DESCRIPTION OF EVENT:

On April 14, 1990, Unit 2 was in Mode 1 at 100 percent power. At 1704 hours, a simultaneous reactor and turbine trip occurred on low turbine electrohydraulic control (EHC) fluid pressure. Workers in the area of the main turbine governor valves reported the rupture of an EHC line to one of the governor valves. A feedwater isolation occurred on low Reactor Coolant System average temperature and an Auxiliary Feedwater System actuation occurred on low steam generator level as expected. The main steam isolation valves were closed to limit the cooldown and the steam generator power operated relief valves (PORV) were used to control temperature. The plant was stabilized in Mode 3.

Investigation of this event revealed that the weld on the EHC supply line to the governor valve had failed at the tube side toe of the weld where it connected to a tee in the supply header. The weld was cut out, rewelded and dye penetrant examined for integrity. At the time, it was believed that the failure had resulted from recent maintenance activities on the governor valve.

On April 25, 1990, following restart of the unit, dye penetrant inspection of the new weld showed a new linear indication. Dye penetrant inspections of other welds of EHC piping on Unit 2 were then performed and additional linear indications were found. Metallurgical examination of the original failure site indicated fatigue failure with origins at multiple locations around the circumference of the pipe. Observation of the Unit 2 EHC piping during plant operation indicated that significant vibration occurred concurrent with vibration of the governor valve. The cyclic stress from the governor valve-induced vibration could have resulted in the earlier fatigue failure. Temporary supports were added which greatly reduced the vibration amplitude. Inspections of Unit 1 EHC piping did not reveal any cracks.

CAUSE OF EVENT:

The cause of the reactor trip was a loss of EHC pressure due to a supply line failure. The line failed due to fatigue stress of a weld caused by governor valve induced vibration.

The cause of the governor valve vibration has been determined to be valve plug rotation.

A1/LER005U2.L01

TEXT PAGE 3 OF 3

ANALYSIS OF EVENT:

Unplanned Reactor Trip System actuation is reportable pursuant to 10CFR50.73(a)(2)(iv). The plant was brought to a stable shutdown in Mode 3. There were no unexpected post trip transients.

CORRECTIVE ACTION:

The new linear indications found on the EHC supply piping have been evaluated and repaired as required.

In the interim, to compensate for the cause of the vibration and limit its effects the following actions are being taken:

1. As a conservative measure, additional supports have been added to the EHC lines on Unit 2 to dampen any unusual vibration.
2. The governor valve control logic has been changed such that the valve which vibrated during operation is now maintained fully open at full load and another valve is modulated to vary turbine load.

The valve used to throttle flow during full power operation will be modified to add anti swirl baffles and anti rotation pins on the plug to stem connection during the first refueling outage. The remaining valves will be modified as schedule permits.

ADDITIONAL INFORMATION:

There have been no previous events reported regarding reactor trips due to failed EHC piping.

A1/LER005U2.L01

ATTACHMENT 1 TO 9005230116 PAGE 1 OF 2

The Light
company South Texas Project Electric Generating
Houston Lighting & Power Station Project Electric Generating
P.O. Box 289
Wadsworth, Texas 77483

May 15, 1990
ST-HL-AE-3462

File No.: G26
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 2
Docket No. STN 50-499
Licensee Event Report 90-005 Regarding a Reactor Trip
Due to Failure of a Main Turbine Electrohydraulic Control Lines

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 90-005) regarding a reactor trip due to failure of a main turbine electrohydraulic control line. This event did not have any adverse impact on the health and safety of the public.

If you should have any question
on this matter, please contact
Mr. C. A. Ayala at (512) 972-8628 or myself at (512) 972-7921.

G. E. Vaughn
Vice President
Nuclear Generation

BEM/n1

Attachment: LER 90-005 (South Texas, Unit 2)

A1/LER005U2.L01

A Subsidiary of Houston Industries Incorporated

ATTACHMENT 1 TO 9005230116 PAGE 2 OF 2

ST-HL-AE-3462

Houston Lighting & Power Company File No. : G26
South Texas Project Electric Generating Station Page 2

cc:

Regional Administrator, Region IV Rufus S. Scott
Nuclear Regulatory Commission Associate General Counsel

611 Ryan Plaza Drive, Suite 1000 Houston Lighting & Power Company
Arlington, TX 76011 P. O. Box 61867
Houston, TX 77208

George Dick, Project Manager
U.S. Nuclear Regulatory Commission INPO
Washington, DC 20555 Records Center
1100 Circle 75 Parkway
J. I. Tapia Atlanta, GA 30339-3064
Senior Resident Inspector
c/o U. S. Nuclear Regulatory Dr. Joseph M. Hendrie
Commission 50 Bellport Lane
P. O. Box 910 Bellport, NY 11713
Bay City, TX 77414
D. K. Lacker
J. R. Newman, Esquire Bureau of Radiation Control
Newman & Holtzinger, P.C. Texas Department of Health
1615 L Street, N.W. 1100 West 49th Street
Washington, DC 20036 Austin, TX 78704

D. E. Ward/R. P. Verret
Central Power & Light Company
P. O. Box 2121
Corpus Christi, TX 78403

J. C. Lanier
Director of Generation
City of Austin Electric Utility
721 Barton Springs Road
Austin, TX 78704

R. J. Costello/M. T. Hardt
City Public Service Board
P. O. Box 1771
San Antonio, TX 78296

Revised 12/15/89

LA/NRC/

*** END OF DOCUMENT ***
